

SAMSUNG

**INSTALLATION MANUAL
MANUAL DE INSTALACIÓN
MANUEL D'INSTALLATION
MANUALE D'INSTALLZIONE
MANUAL DE INSTALAÇÃO
INSTALLATIONS-HANDBUCH
ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ
ИНСТРУКЦИЯ ПО УСТАНОВКЕ**

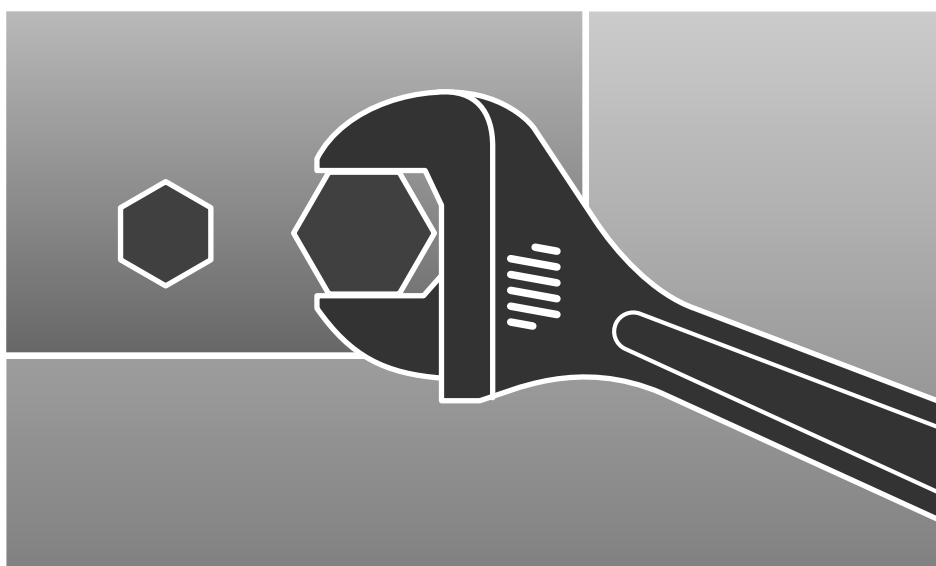
Heat pump

RVMH050CBM0
RVMH060GBM0
RVMH060GDM0
RVMH080GAM0
RVMH100GAM0
RVMH100GCM0
RVMH100FAM0

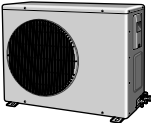
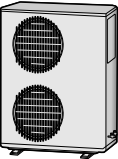
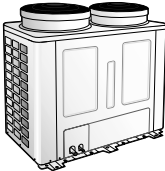
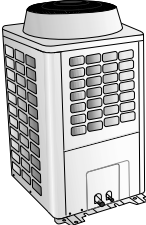
Cooling only

RVMC035EBM0
RVMC050CBM0
RVMC060GAM0
RVMC060GAM1
RVMC070FAM0
RVMC100GAM0
RVMC100FAM0

**System Air Conditioner
Aire acondicionado sistemático
Climatiseur numérique multifonctionnel
Sistema Aria Condizionata
Sistema Ar Condicionado
Klimaanlage System
Σύστημα Κλιματισμού
Системный Воздушный Кондиционер**



Contents

Type of outdoor unit	A	B	C	D	E
Design					
Model	RVMC035EBM0	B-1 RVMC050CBM0 RVMH050CBM0 B-2 RVMH060GBM0 RVMH060GDM0		RVMC060GAM0 RVMC060GAM1 RVMC070FAM0	RVMH080GAM0 RVMH100GAM0 RVMH100GCM0 RVMH100FAM0 RVMC100GAM0 RVMC100FAM0



OUTDOOR UNIT INSTALLATION

■ Preparation for Outdoor Unit Installation	4
■ Deciding on Where to Install the Outdoor Unit	5
■ Outdoor Unit Installation	7
■ Connecting the Cable	8
■ Piping and refnet joint selection	12
■ Connecting the Refrigerant Pipe	16
■ Performing Leak Test & Vacuum Drying	17
■ Insulation	19
■ Adding Refrigerant	20
■ Checking Correct Grounding	24
■ Setting Up Option Switches	25
■ Functions of KEY on the Outdoor Unit PCB	26
■ Checking and Testing Operations	28
■ Troubleshooting	30



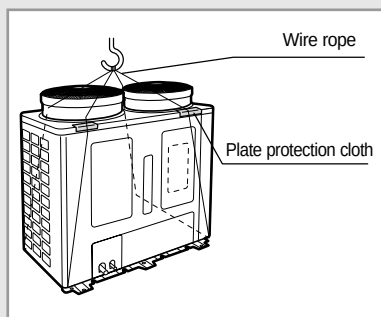
OPTIONAL ACCESSORIES

■ Parts List	33
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OUTDOOR UNIT INSTALLATION

- Preparation for Outdoor Unit Installation 4
- Deciding on where to Install the Outdoor Unit 5
- Outdoor Unit Installation 7
- Connecting the Cable 8
- Piping and refnet joint selection 12
- Connecting the Refrigerant Pipe 16
- Performing Leak Test & Vacuum Drying 17
- Insulation 19
- Adding Refrigerant 20
- Checking Correct Grounding 24
- Setting Up Option Switches 25
- Functions of KEY on the Outdoor Unit PCB 26
- Checking and Testing Operations 28
- Troubleshooting 30

Preparation for Outdoor Unit Installation



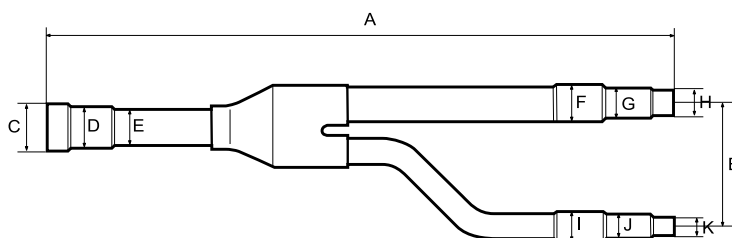
Moving the Outdoor Unit by Wire Rope

Fasten the outdoor unit by two 8m or longer wire ropes as shown at the figure. To protect damage or scratches, insert a piece of cloth between the outdoor unit and rope, then move the unit.

How to choose Refnet Joint

A user must purchase a refnet joint to connect the indoor unit to the outdoor unit.

◆ **Choose the first refnet joint depending on the table below.**



Refnet joint	Distance (mm)		Inner diameter (mm)								
	A	B	C	D	E	F	G	H	I	J	K
MXJ-0906A	420	80	9.7	-	-	9.7	6.5	-	9.7	6.5	-
MXJ-1206A	420	80	12.8	-	-	12.8	9.7	6.5	12.8	9.7	6.5
MXJ-2212A	460	90	22.4	19.2	16.0	19.2	16.0	12.8	16.0	12.8	-
MXJ-3112A	460	90	31.9	28.7	25.6	25.6	19.2	16.0	19.2	16.0	12.8

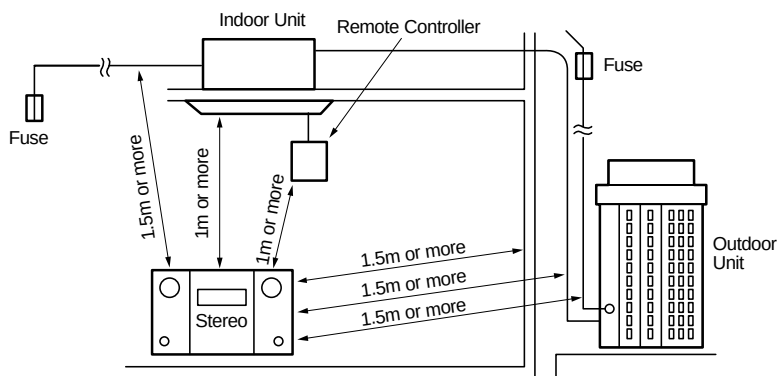
◆ **Choose the others according to the total capacity of indoor units.**

Total capacity of indoor units	Refnet joint	
	Liquid	Gas
16000W or less	MXJ-0906A	MXJ-2212A
16000W or more	MXJ-1206A	MXJ-3112A

Deciding on Where to Install the Outdoor Unit

Outdoor Unit

- ◆ The outdoor unit must NEVER be placed on its side or upside down, as the compressor lubrication oil will run into the cooling circuit and seriously damage the unit.
- ◆ Choose a location that is dry and sunny, but not exposed to direct sunlight or strong winds.
- ◆ Do not block any passageways or thoroughfares.
- ◆ Choose a location where the noise of the air conditioner when running and the discharged air do not disturb any neighbours.
- ◆ Choose a position that enables the pipes and cables to be easily connected to the indoor unit.
- ◆ Install the outdoor unit on a flat, stable surface that can support its weight and does not generate any unnecessary noise and vibration.
- ◆ Position the outdoor unit so that the air flow is directed towards the open area.
- ◆ Maintain sufficient clearance around the outdoor unit, especially from a radio, computer, stereo system, etc.



- ◆ If the outdoor unit is installed at a height, ensure that its base is firmly fixed in position.
- ◆ Make sure that the water dripping from the drain hose runs away correctly and safely.

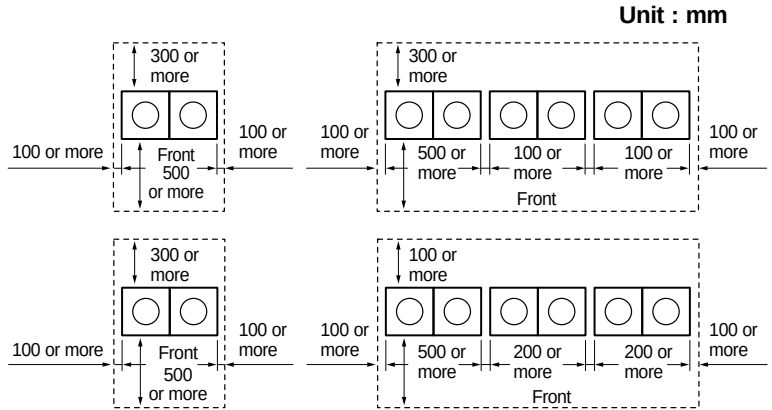
CAUTION

- ◆ ***You have just purchased a system air conditioner and it has been installed by your installation specialist.***
- ◆ ***This device must be installed according to the national electrical rules.***

Deciding on Where to Install the Outdoor Unit (cont.)

Space Requirements for Outdoor Unit

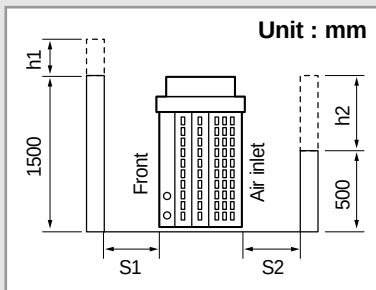
If there is no obstacle around the outdoor unit...



- * Max. height of obstacle
- Front side : 1500mm or less
 - Air inlet side : 500mm or less
 - Right/Left side : No limit

If there is an obstacle around the outdoor unit...

- ◆ If an obstacle in front of the outdoor unit is higher than 1500mm, the half of additional height should be added to the S1.
- ◆ If an obstacle behind the outdoor unit is higher than 500mm, the half of additional height should be added to the S2.



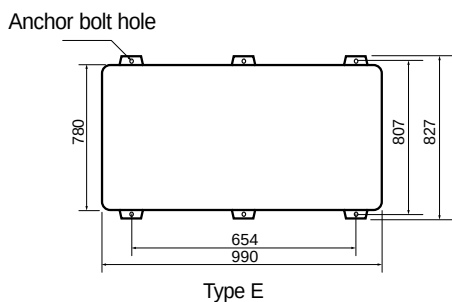
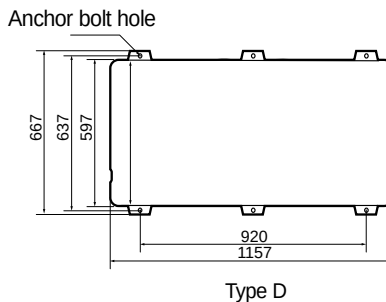
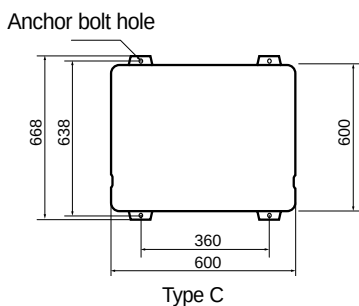
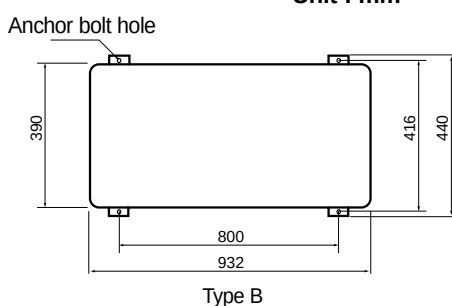
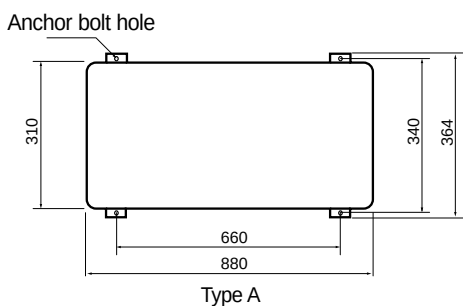
Outdoor Unit Installation

The outdoor unit must be installed on a rigid and stable base to avoid any increase in the noise level and vibration, particularly if the outdoor unit is to be installed in a location exposed to strong winds or at a height, the unit must be fixed to an appropriate support(wall or ground).

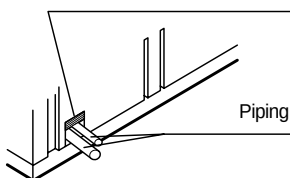
Fix the outdoor unit with anchor bolts.

Note ♦ The anchor bolt must be 20mm or higher from the base surface.

Unit : mm



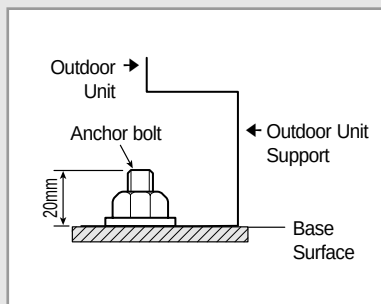
To prevent the unit against a wild animal or something, cover  part after connecting the pipe.



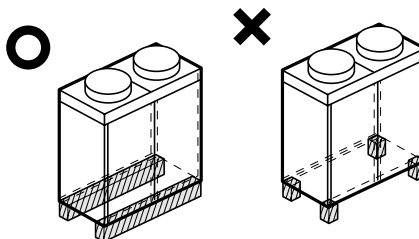
Outdoor Unit Installation (cont.)

CAUTION

- ◆ **Make a drain outlet around the base for outdoor unit drainage.**
- ◆ **If the outdoor unit is installed on the roof, you have to check the ceiling strength and waterproof the unit.**



Outdoor Unit Support



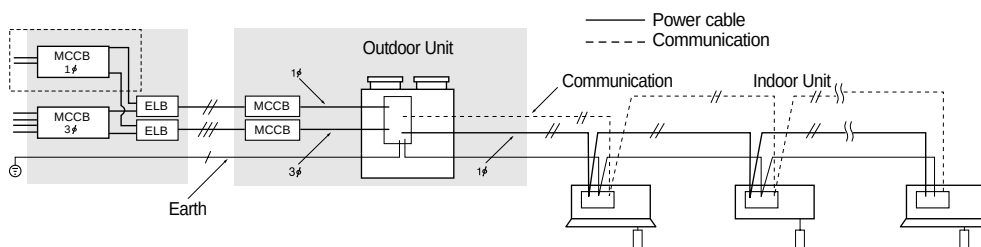
Connecting the Cable

Two electronic cables must be connected to the outdoor unit.

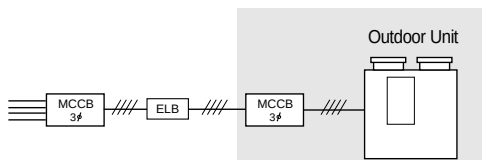
- ◆ The connection cord between indoor unit and outdoor units
- ◆ The power cable between outdoor unit and auxiliary circuit breaker.

Example of Air Conditioner System

When using ELBs for 3 phase and 1 phase



When using an ELB for 3 phase 4 wires



* If an outdoor unit is installed in a place in danger of an electric leak or submergence, you must install the ELB.

Connecting the Cable (cont.)

Power Cable Specification

Type of outdoor unit	Power Supply												Earth Cable	Commu- nication Cable
	3 Phase						Single Phase							
	Power Supply	Max/Min (V)	MCCB	ELB	Power Cable	Length	Power Supply	Max/Min (V)	MCCB	ELB	Power Cable	Length		
A	-	-	-	-	-	-	208-230V~ /60Hz	253/187	25A	25A	3.5mm ² , CV, 3Wires	-	Ø1.6mm, HOS-RN-F, 1 Wire	0.75~1.25mm ² HOS-RN-F, 2 Wires
B	380-415V~ /50Hz	456/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~ /50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
	208-230V~ /60Hz	253/187	-	-		18m or less	208-230V~ /60Hz	253/187	15A	15A		-		
						18m~28m						-		
	-	-	-	-		18m or less								
					18m~28m									
C	380-415V~ /50Hz	456/342	Frame:30A Trip:20A	20A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~ /50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
	-	-	-	-		18m or less								
					18m~28m									
D	380-415V~ /50Hz	456/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~ /50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m								
	208-230V~ /60Hz	253/187	Frame:75A Trip:50A	50A	8.0mm ² , HOS-RN-F, 3 Wires	18m or less	208-230V~ /60Hz	253/187	15A	15A				
					14.0mm ² , HOS-RN-F, 3 Wires	18m~28m								
	308V /60Hz	418/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220V /60Hz	242/198	15A	15A				
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m								
E	380-415V~ /50Hz	456/342	Frame:75A Trip:50A	50A	8.0mm ² , HOS-RN-F, 3 Wires	20m or less	220-240V~ /50Hz	264/198	20A	20A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					14.0mm ² , HOS-RN-F, 3 Wires	20m~50m								
	208-230V~ /60Hz	253/187	Frame:100A Trip:75A	75A	14.0mm ² , HOS-RN-F, 3 Wires	20m or less	208-230V~ /60Hz	253/187	20A	20A				
					22.0mm ² , HOS-RN-F, 3 Wires	20m~50m								

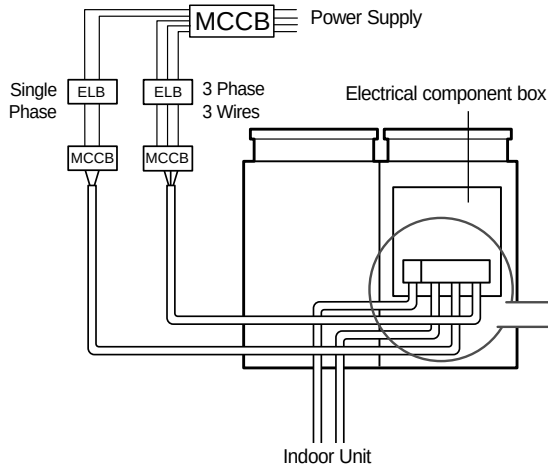
* The power cable is not supplied with air conditioner.

IMPORTANT : All power supply cables/interconnection cables and communication cables must be type HOS-RN-F (at least).

Connecting the Cable (cont.)

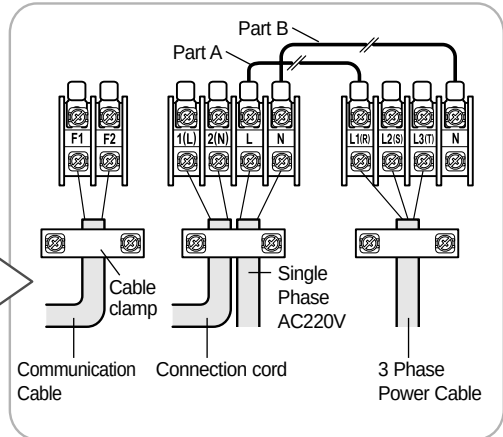
Wiring Diagram of Power Cable

When using ELBs for 3 phase and 1 phase

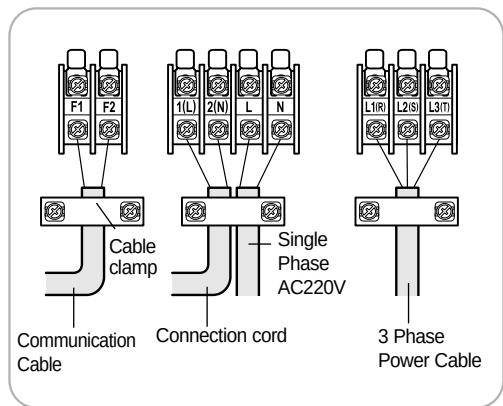


◆ Case 1

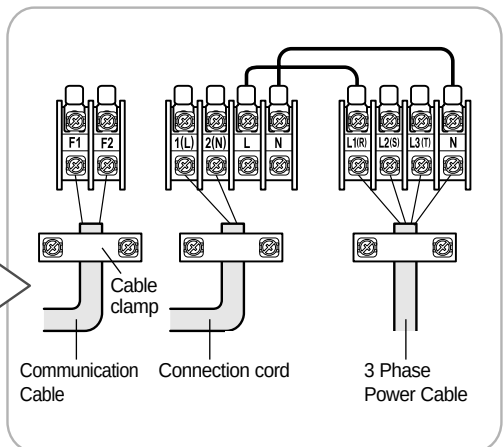
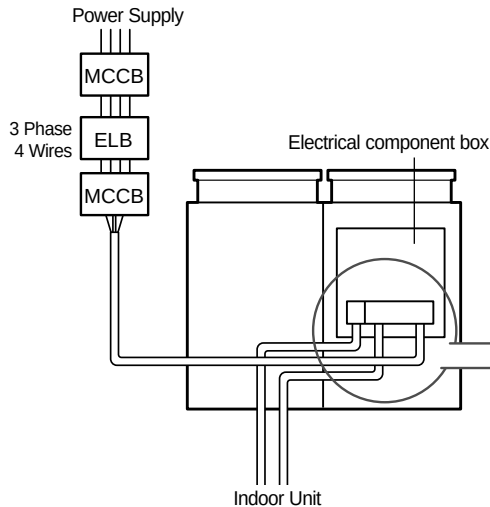
Cut off the part A and B



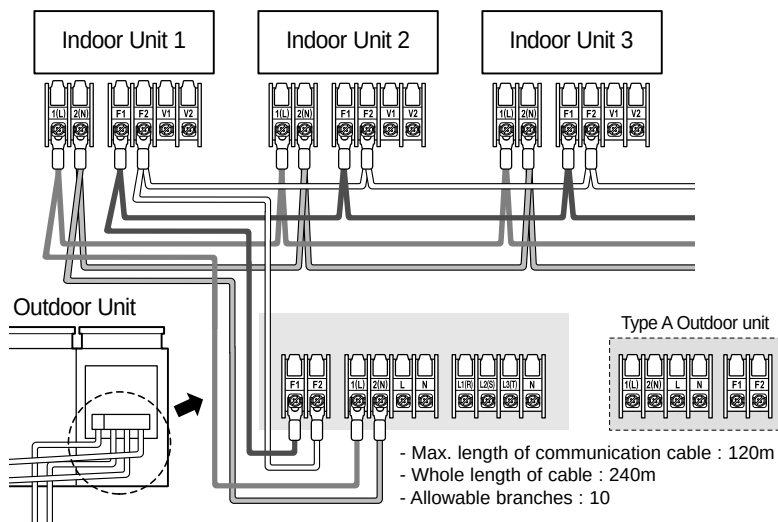
◆ Case 2



When using an ELB for 3 phase 4 wires



Wiring Diagram of Connection Cord

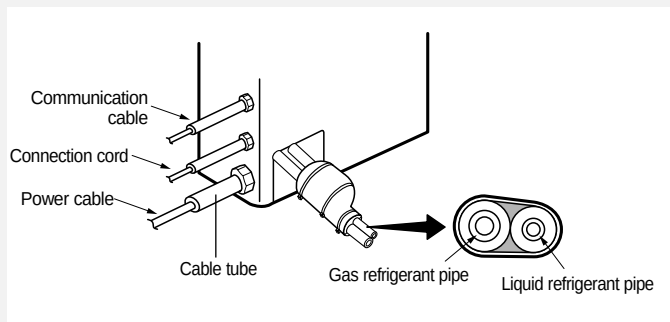


Connection Cord Specifications

Power Supply (Single Phase)			Earth Cable	Communication Cable (HOS-RN-F, 2wires)	Home server (HOS-RN-F, 2wires)
Power Supply	Max/Min(V)	Power Cable			
220V/60Hz 220-240V~/50Hz 208-230V~/60Hz	±10%	2.0mm ² (HOS-RN-F, 2wires)	Ø1.6mm (HOS-RN-F, 1wire)	0.75~ 1.25mm ²	0.75~ 1.25mm ²

CAUTION

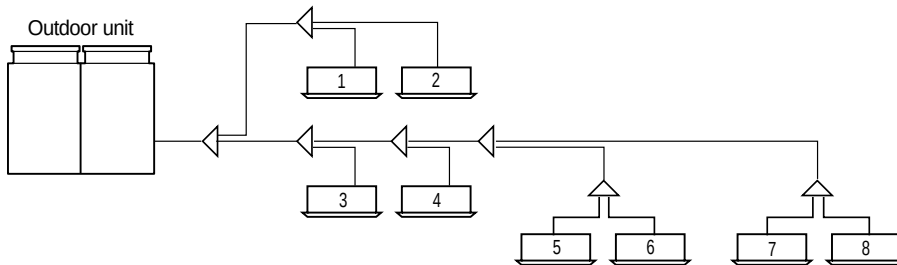
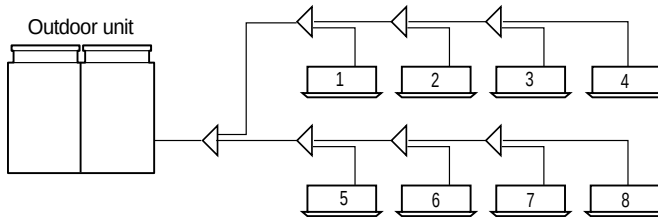
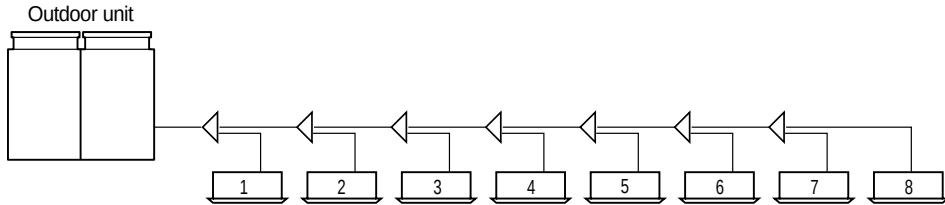
- ◆ **When connecting cables, make the cable pass through the cable tube as shown at the figure.**



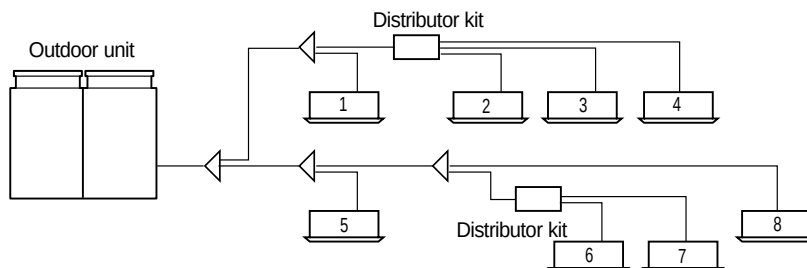
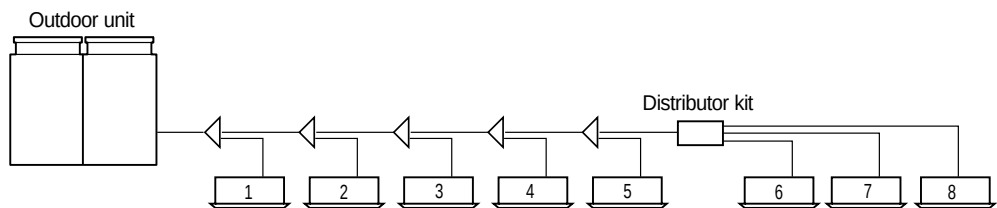
- ◆ **Must keep the cable in a protection tube.**
- ◆ **Keep distances of 50mm or more between power cable and communication cable.**

Piping and refnet joint selection

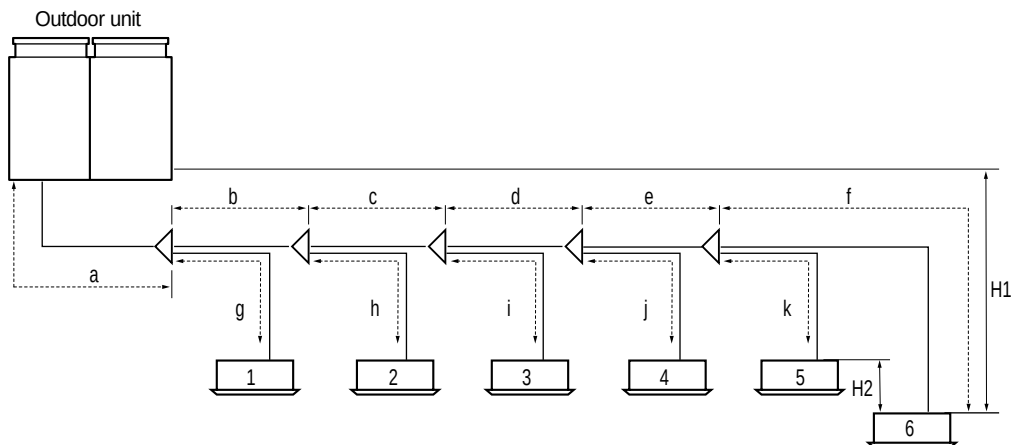
Examples of using only Refnet joint (during 8 rooms installation)



Examples of using both Refnet joint and distributor kit (during 8 rooms installation)



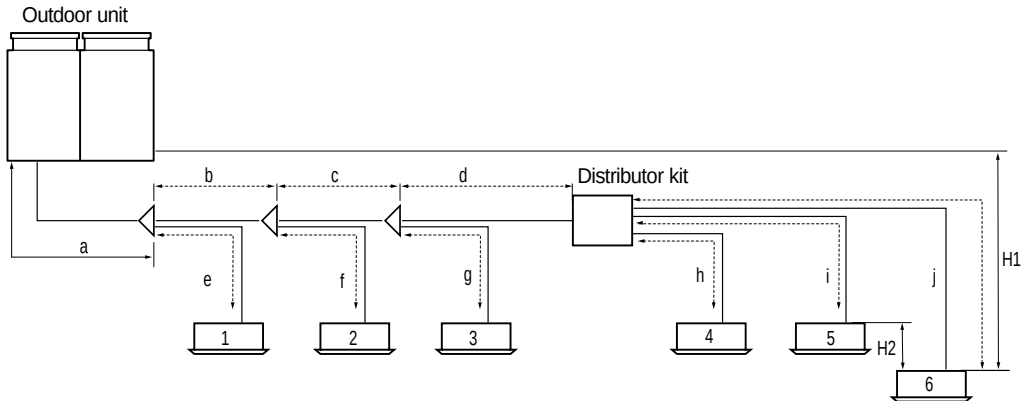
Limitation when piping is installed by using only Refnet joint (during 6 rooms installation)



Outdoor unit			Type A	Type B-1	Type B-2	Type C	Type D	Type E
Max. allowable length	Distance of the remotest indoor unit from the outdoor unit	Actual length (m)	-	70		-	100	
			ex) In case of Type E $a+b+c+d+e+f \leq 100\text{m}$					
		Equivalent length (m)	-	87		-	125	
			ex) In case of Type E $\leq 125\text{m}$					
Max. allowable height difference	Height difference between outdoor unit and indoor unit (m) = H1(the figures in the parenthesis is applied when the outdoor unit is installed below the indoor unit)		-	30 (30)		-	50 (40)	
	Height difference between indoor unit = H2		15m					
Allowable length after branching			The distance from the first refnet joint to the indoor unit : shorter than 30m ex) $b+c+d+e+f \leq 30\text{m}$, $b+c+i \leq 30\text{m}$					
			The distance between the max piping and min piping length from 1 refnet joint $\leq 20\text{m}$					

Piping and refnet joint selection (cont.)

Requirement when piping is installed using simultaneously both refnet joint and contributor kit (during 6 rooms installation)



Outdoor unit			Type A	Type B-1	Type B-2	Type C	Type D	Type E
Max. allowable length	Distance of the remotest indoor unit from the outdoor unit	Actual length (m)	-	70		-	100	
			ex) In case of Type E $a+b+c+d+j \leq 100\text{m}$					
		Equivalent length (m)	-	87		-	125	
			ex) In case of Type E $\leq 125\text{m}$					
Max. allowable height difference	Height difference between outdoor unit and indoor unit (m) = H1 (the figures in the parenthesis is applied when the outdoor unit is installed below the indoor unit)		-	30 (30)		-	50 (40)	
	Height difference between indoor unit = H2		15m					
Allowable length after branching			The distance from the first refnet joint to the indoor unit : ex) $b+c+d+j \leq 30\text{m}$, $b+c+d+h \leq 30\text{m}$					
			Between distributor kit and indoor unit $\leq 30\text{m}$					

Piping selection

(Unit : mm)

Outdoor unit			Type A	Type B-1	Type B-2	Type C	Type D	Type E
Outdoor unit ~ The first refnet joint piping								
Piping size		Liquid pipe	-	ø9.52 X t0.8		-	ø12.70 X t0.8	
		Gas pipe	-	ø19.05 X t1.2	ø22.23 X t1.2	-	ø25.40 X t1.2	ø28.60 X t1.2
Refnet joint ~ refnet joint piping								
Liquid pipe	Capacity limit of rear indoor unit	Less than 16000W	ø9.52 X t0.8					
		More than 16000W	-			-	ø12.70 X t0.8	
Gas pipe	Capacity limit of rear indoor unit	Less than 9000W	ø15.88 X t1.0					
		9000W ~ 16000W	ø19.05 X t1.2					
		16000W ~ 21000W	-			-	ø25.40X t1.2	
		More than 21000W	-					ø28.60 X t1.2
Refnet joint ~ indoor unit piping								
Liquid pipe	Capacity limit of rear indoor unit	Less than 4700W	ø6.35 X t0.7					
		More than 4700W	ø9.52 X t0.8					
Gas pipe	Capacity limit of rear indoor unit	Less than 4700W	ø12.70 X t0.9					
		4700W ~ 8500W	ø15.88 X t1.0					
		More than 8500W	ø19.05 X t1.2					

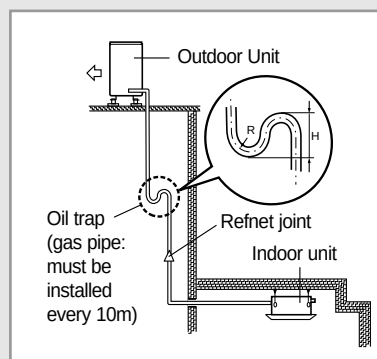
Install the oil trap

- ◆ Install the oil trap in case that the outdoor unit is situated higher than the indoor unit.
- ◆ Install the oil trap only in the gas pipe for cooling operation.
- ◆ Install the oil trap only between the outdoor unit and the first refnet joint. In this case, it must be installed every 10 meters from the outdoor unit.
- ◆ The radius of curvature(R) is as followings.

(Unit : mm)

The diameter of the gas pipe(D)	12.70	15.88	19.05	22.23	25.40	28.60	31.75
The radius of curvature(R)	25 or more	32 or more	38 or more	41 or more	51 or more	57 or more	60 or more

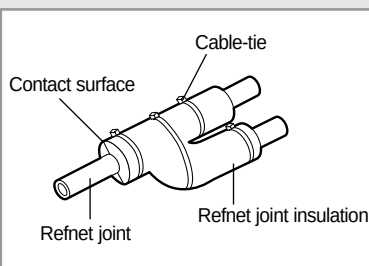
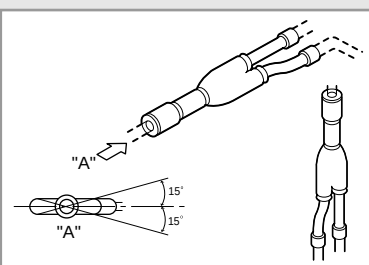
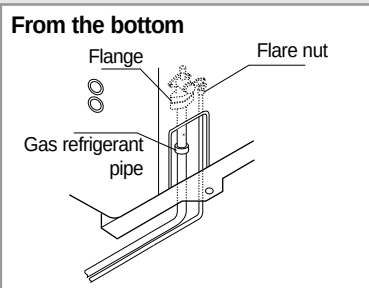
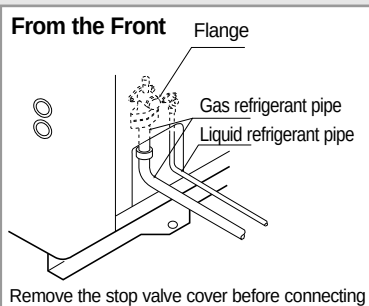
- ◆ The height of the oil trap(H) : $4R \leq H \leq 6R$



Connecting the Refrigerant Pipe

Refrigerant Piping

The refrigerant pipe can be connected from the bottom or front of the outdoor unit. You have to use seamless copper pipe for the piping and check the length and height difference between indoor and outdoor unit. You should also check the pipe length after installing the refnet joint. For maximum allowable pipe length and height difference, refer to page 15.



- 1 Connect the refrigerant pipe to each pipe, tightening the nuts, first manually and then with a wrench, a spanner applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	144~176
9.52 mm (3/8")	333~407
12.70 mm (1/2")	504~616
15.88 mm (5/8")	630~770
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

Note

- ◆ Make a distinction between liquid refrigerant pipe and gas refrigerant pipe.

Liquid	Gas
Bend the pipe or use the elbow.	Cut off the gas piping and use the elbow.

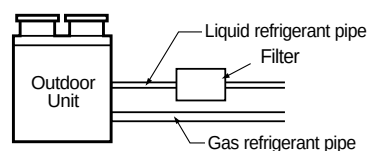
- 2 Install the refnet joint horizontally or vertically ; for choice of the refnet joint, refer to page 6.

- 3 Fix the refnet joint insulation to the refnet joint as shown at figure.

Installation of piping filter

- ◆ Install the piping filter in the liquid refrigerant pipe using flare nuts. You should install the filter within 1m from the outdoor unit.

- ◆ Specifications of piping filter
 - Size: 20μm
 - Max applicable pressure: 40kgf/cm²
 - Types
 - 1-way filter for cooling only model
 - 2-way filter for heat pump model



Performing Leak Test & Vacuum Drying

Before completing the installation(insulation of the hose and piping), you must check that there are no gas leaks and remove air in the unit.

-
- 1 Purge the refrigerant pipes and perform the vacuum test.

Note ♦ The pressure should not be increased for 1 minute.

-
- 2 Inject nitrogen into the pipes until the pressure becomes 2kg/cm² at least.

-
- 3 Check for gas leaks by using soapy water.

-
- 4 Let the pipes under 28kg/cm² pressure for 24 hours, then check that the pressure has been decreased.

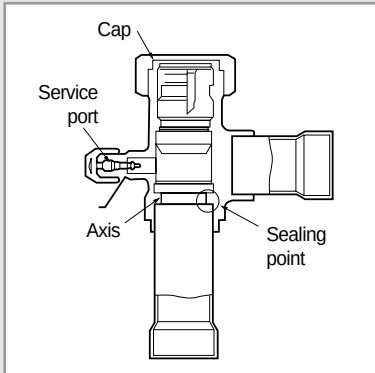
-
- 5 Discharge the nitrogen.

-
- 6 Make the pipes vacuous.

-
- 7 If the piping is longer than the standard length, refrigerant must be added. For further details on adding refrigerant, refer to page 20.

-
- 8 Set the outdoor unit valves to the open position, then the refrigerant circulate through whole air conditioner system.
-

Performing Leak Test & Vacuum Drying (cont.)



Using Stop Valve

To Open the Stop Valve

- 1 Open the cap and turn the stop valve counterclockwise by using a hexagonal wrench.
- 2 Turn it until the axis is stopped.

Note

- ◆ Do not apply excessive force to the stop valve and always use special instruments. Otherwise, the stopping box can be damaged and the back sheet can leak.
- ◆ If the watertight sheet leaks, turn the axis back by half, tighten the stopping box, then check the leakage again. If there is no leakage any more, tighten the axis entirely.

- 3 Tighten the cap securely.

To Close the Stop Valve

- 1 Remove the cap.
- 2 Turn the stop valve clockwise by using a hexagonal wrench.
- 3 Tighten the axis until the valve reached the sealing point.
- 4 Tighten the cap securely.

CAUTION

- ◆ When you use the service port, always use a charging hose, too.
- ◆ Check the leakage of refrigerant gas after tightening the cap.
- ◆ Must use a spanner and wrench when you open/tighten the stop valve.

Insulation

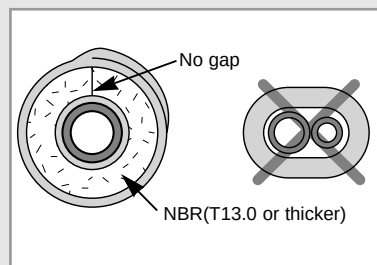
Once you have checked that there are no leaks in the system, you can insulate the piping and hose.

- 1 To avoid condensation problems, place an insulator around each refrigerant pipe.

Note

- ◆ When insulate the pipe, be sure to overlap the insulation.
- ◆ You have to use more than 120°C insulation(T13.0 or thicker Acrylonitrile Butadien Rubber) for the gas refrigerant pipe.

- 2 If you have not insulated the refnet joint, you should insulate it.
For the refnet joint insulation, refer to page 16.



Adding Refrigerant

The outdoor unit is loaded with sufficient refrigerant for the standard piping. Thus, refrigerant must be added if the piping is lengthened. This operation can only be performed by a qualified refrigeration specialist. For quantity of adding refrigerant, refer to page 21.

- 1 Check that the stop valve is closed entirely.

- 2 Charge the refrigerant through the service port of liquid stop valve.

Note ♦ Do not charge the refrigerant through the gas side service port.

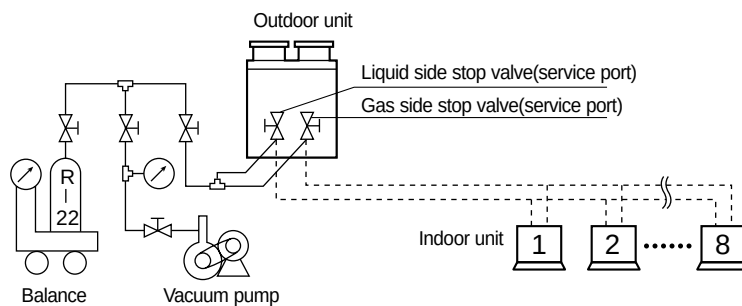
- 3 If you cannot charge the refrigerant according to the upper steps, following these:

3-1 Open both liquid stop valve and gas stop valve.

3-2 Operate the air conditioner by pressing the key 2 on the outdoor unit PCB.

3-3 About 30 minutes later, charge the refrigerant through the service port of gas stop valve.

Note ♦ If necessary, refer to the pressure table classified by outdoor temperature.

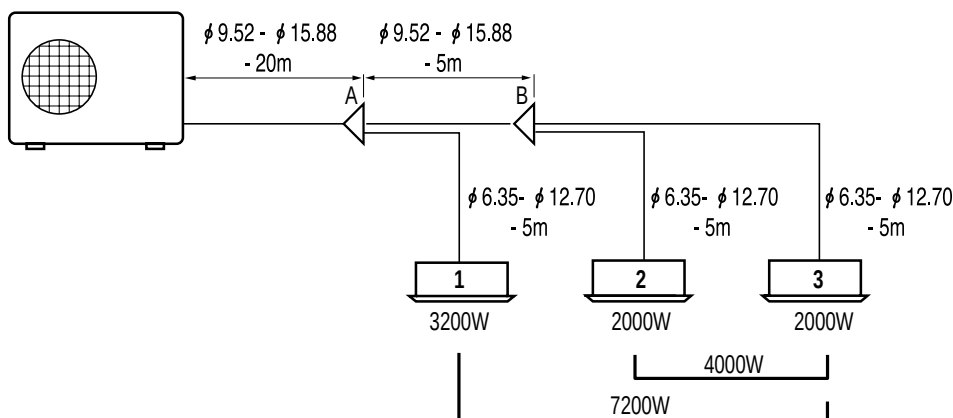


How to Calculate the Quantity of Adding Refrigerant

Outer diameter of liquid refrigerant pipe	6.35mm	9.52mm	12.70mm	12.70mm(Type E)
Quantity of adding refrigerant per metre	50g/m	80g/m	120g/m	140g/m

i.e. 3 indoor units (Type A)

- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre - 500g
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant

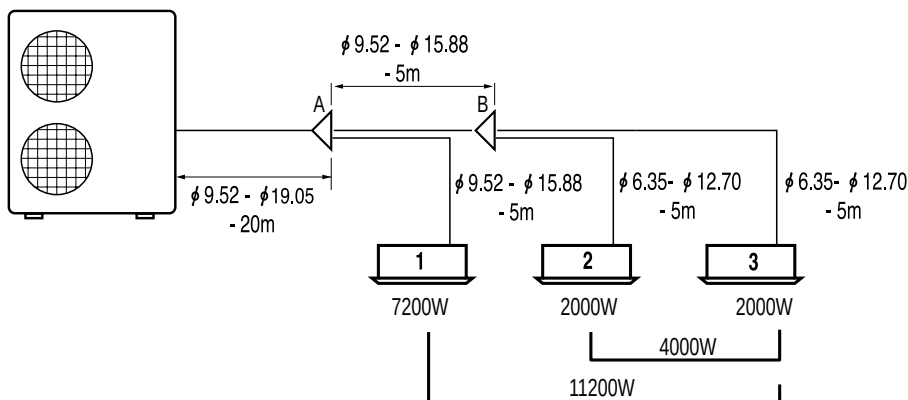
$$= (\text{Length of } \phi 9.52 \text{ liquid pipe} \times 80\text{g/m}) + (\text{Length of } \phi 6.35 \text{ liquid pipe} \times 50\text{g/m}) - 500\text{g}$$

$$= (25\text{m} \times 80\text{g/m}) + (15\text{m} \times 50\text{g/m}) - 500\text{g}$$

$$= 2250\text{g}$$

i.e. 3 indoor units (Type B-1)

- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre - standard quantity(1000g)
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant

$$= (\text{Length of } \phi 9.52 \text{ liquid pipe} \times 80\text{g/m}) + (\text{Length of } \phi 6.35 \text{ liquid pipe} \times 50\text{g/m}) - 1000\text{g}$$

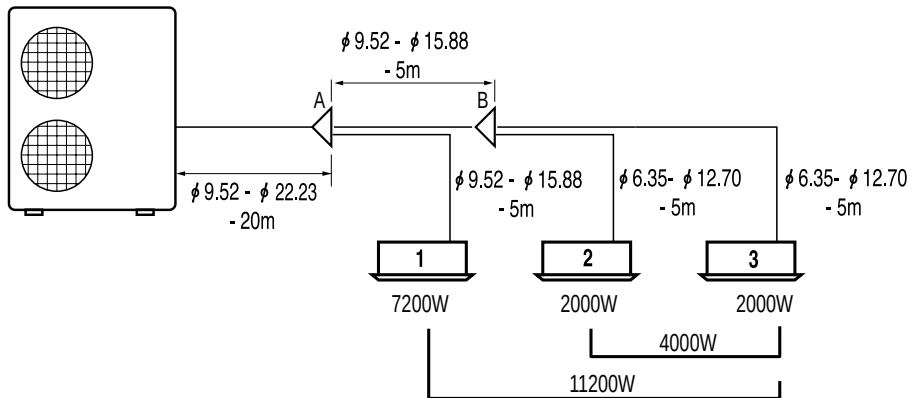
$$= (30\text{m} \times 80\text{g/m}) + (10\text{m} \times 50\text{g/m}) - 1000\text{g}$$

$$= 1900\text{g}$$

Adding Refrigerant (Cont.)

i.e. 3 indoor units (Type B-2)

- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre - standard quantity(1000g)
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant

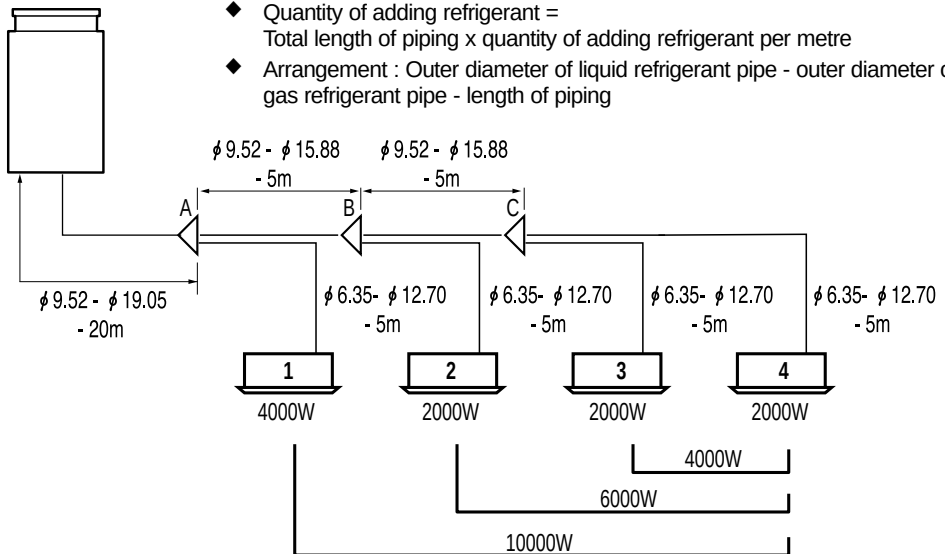
$$= (\text{Length of } \phi 9.52 \text{ liquid pipe} \times 80\text{g/m}) + (\text{Length of } \phi 6.35 \text{ liquid pipe} \times 50\text{g/m}) - 1000\text{g}$$

$$= (30\text{m} \times 80\text{g/m}) + (10\text{m} \times 50\text{g/m}) - 1000\text{g}$$

$$= 1900\text{g}$$

i.e. 4 indoor units (Type C)

- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant

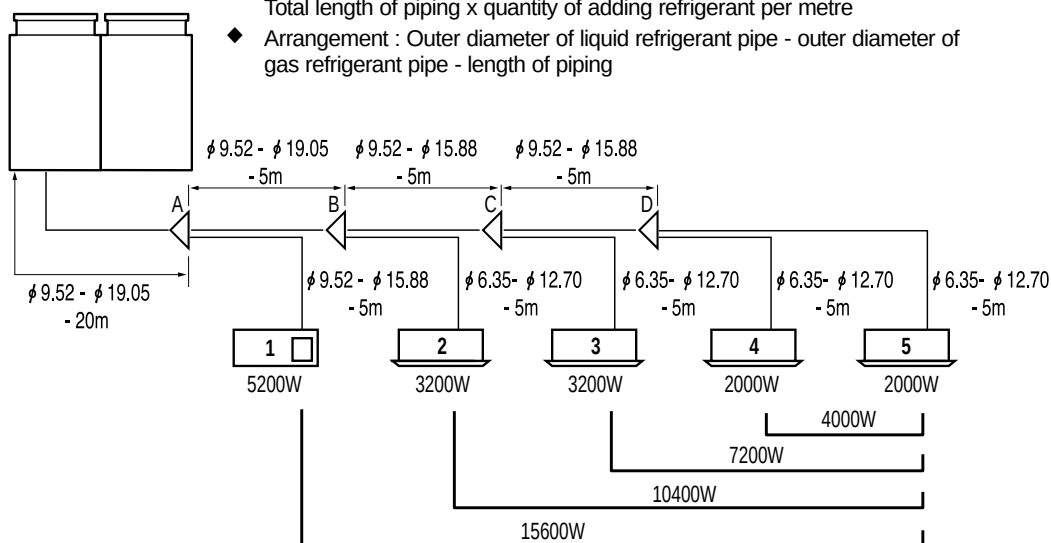
$$= (\text{Length of } \phi 9.52 \text{ liquid pipe} \times 80\text{g/m}) + (\text{Length of } \phi 6.35 \text{ liquid pipe} \times 50\text{g/m})$$

$$= (30\text{m} \times 80\text{g/m}) + (20\text{m} \times 50\text{g/m})$$

$$= 3400\text{g}$$

i.e. 5 indoor units (Type D)

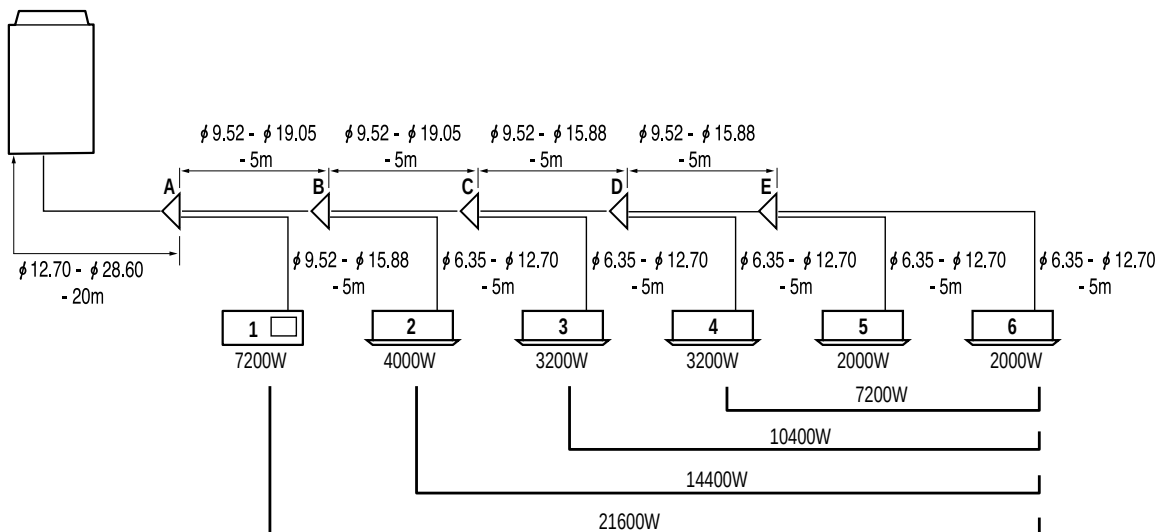
- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant
 = (Length of ø9.52 liquid pipe x 80g/m) + (Length of ø6.35 liquid pipe x 50g/m)
 = (40m x 80g/m) + (20m x 50g/m)
 = 4200g

i.e. 6 indoor units (Type E)

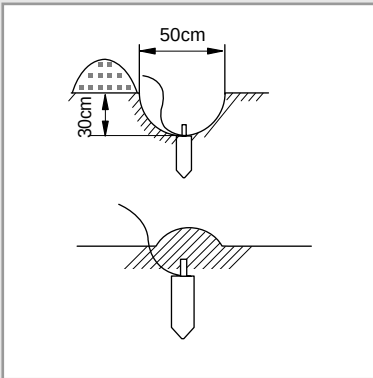
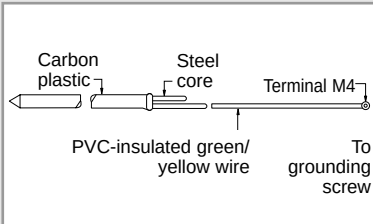
- ◆ Quantity of adding refrigerant =
Total length of piping x quantity of adding refrigerant per metre - standard quantity(1100g)
- ◆ Arrangement : Outer diameter of liquid refrigerant pipe - outer diameter of gas refrigerant pipe - length of piping



* Quantity of adding refrigerant
 = (Length of ø12.70 liquid pipe x 140g/m) + (Length of ø9.52 liquid pipe x 80g/m) + (Length of ø6.35 liquid pipe x 50g/m) - 1100g
 = (20m x 140g/m) + (25m x 80g/m) + (25m x 50g/m) - 1100g
 = 4950g

Checking Correct Grounding

If the power distribution circuit does not have an earth or the ground does not comply with specifications, an grounding electrode must be installed. The corresponding accessories are not supplied with the air conditioner.



- 1 Select an grounding electrode that complies with the specifications given in the illustration.

- 2 Determine a suitable location for the grounding electrode:
 - ◆ In damp hard soil rather than loose sandy or gravel soil that has a higher grounding resistance
 - ◆ Away from underground structures or facilities, such as gas pipes, water pipes, telephone lines and underground cables
 - ◆ At least two metres away from a lightening conductor grounding electrode and its cable

Note ◆ The grounding wire for the telephone line cannot be used to ground the air conditioner.

- 3 Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.

- 4 Install a green/yellow coloured grounding wire:
 - ◆ If the grounding wire is too short, connect an extension lead, in a mechanical way and wrapping it with insulating tape (do not bury the connection)
 - ◆ Secure the grounding wire in position with staples

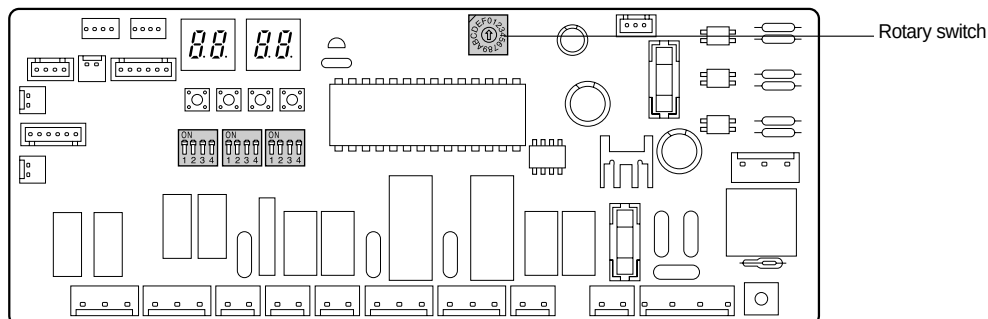
Note ◆ If the grounding electrode is installed in an area of heavy traffic, its wire must be connected securely.

- 5 Carefully check the installation, by measuring the grounding resistance with a ground resistance tester. If the resistance is above required level, drive the electrode deeper into the ground or increase the number of grounding electrodes.

- 6 Connect the grounding wire to the electrical component box inside of the outdoor unit.

Setting up Option Switches

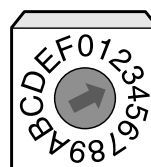
Outdoor Unit PCB



Rotary Switch

You should display that how many indoor units are connected to the outdoor unit. Refer to the table below, then turn the arrow to appropriate position.

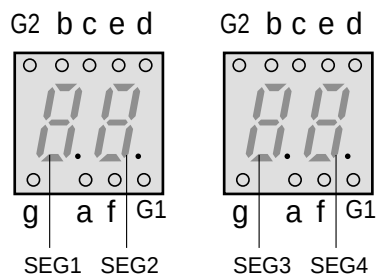
Switch No.	Number of indoor unit(s)	Switch No.	Number of indoor unit(s)
1	One	9	Nine
2	Two	A	Ten
3	Three	B	Eleven
4	Four	C	Twelve
5	Five	D	Thirteen
6	Six	E	Fourteen
7	Seven	F	Fifteen
8	Eight	-	-



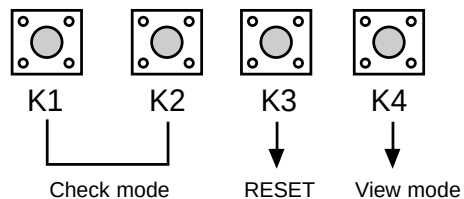
Functions of KEY on the Outdoor Unit PCB

KEY Functions

Display



KEY



Summary of KEY functions

Number of press times \ Function	KEY 1 (Displayed on SEG 3, 4)	KEY 2 (Displayed on SEG 3, 4)	KEY 3 (Displayed on SEG 3, 4)	KEY 4 (Displayed on SEG 3, 4)
1	Adding refrigerant for heat pump models (K1)	Adding refrigerant for cooling only models (K3)	Reset	Displays data
2	Test operation for heat pump models (K2)	Test operation for cooling only models (K4)	-	-
3	End	Pump Down for recovery of refrigerant(K5)	-	-
4	-	End	-	-

Check Mode

- 1 Pressing KEY 1 : Adding refrigerant for heat pump models - Test operation
for heat pump models - Operation with no function.
 - ◆ SEG 1, 2: Display communication status
 - ◆ SEG 3, 4: Flicker with an appropriate KEY function
- 2 Pressing KEY 2 : Adding refrigerant for cooling only models - Test operation
for cooling only models - Operation with no function
 - ◆ SEG 1, 2: Display communication status
 - ◆ SEG 3, 4: Flicker with an appropriate KEY function
- 3 Pressing KEY 3 : Reset & tracking
 - ◆ SEG 1, 2: Display communication status
 - ◆ SEG 3, 4: Off

View Mode

If you press KEY 4, the display shows you temperature and cycle data according to number of times. Refer to the table below.

Number of press times	Contents	Display	Remark	Example
1	Data of high pressure	SEG 1 : Flickers with 1 SEG 2, 3, 4: Display data	Displayed up to the 1st decimal place	21.2kg/cm ² (SEG 2: 2, SEG 3: 1, SEG 4: 2)
2	Data of low pressure	SEG 1 : Flickers with 2 SEG 2, 3, 4: Display data	Displayed up to the 1st decimal place	8.2kg/cm ² (SEG 2: Off, SEG 3: 8, SEG 4: 2)
3	Outlet temperature of PWM compressor (Discharge)	SEG 1 : Flickers with 3 SEG 2, 3, 4: Display data	-	101°C (SEG 2: 1, SEG 3: 0, SEG 4: 1)
4	Condensation temperature	SEG 1 : Flickers with 4 SEG 2, 3, 4: Display data	-	101°C (SEG 2: 1, SEG 3: 0, SEG 4: 1)
5	Outdoor temperature	SEG 1 : Flickers with 5 SEG 2, 3, 4: Display data	-	15°C (SEG 2: Off, SEG 3: 1, SEG 4: 5)
6	Steps of electronic expansion valve	SEG 1 : Flickers with 6 SEG 2, 3, 4: Display data	-	100 STEP (SEG 2: 1, SEG 3: 0, SEG 4: 0)
7	Temperature of COND OUT	SEG 1 : Flickers with 7 SEG 2, 3, 4: Display data	-	-10°C (SEG 2: -, SEG 3: 1, SEG 4: 0)
8	Temperature of OIL	SEG 1 : Flickers with 8 SEG 2, 3, 4: Display data	-	22°C (SEG 2: Off, SEG 3: 2, SEG 4: 2)
9	Temperature of SUCTION	SEG 1 : Flickers with 9 SEG 2, 3, 4: Display data	-	22°C (SEG 2: Off, SEG 3: 2, SEG 4: 2)
10	Steps of outdoor fan	SEG 1 : Flickers with A SEG 2, 3, 4: Display data	-	12 STEP (SEG 2: Off, SEG 3: 1, SEG 4: 2)
11	Discharge temperature of fixed compressor	SEG 1 : Flickers with B SEG 2, 3, 4: Display data	-	101°C (SEG 2: 1, SEG 3: 0, SEG 4: 1)
12	Stopping of View mode Displaying communication data	SEG 1, 2 : Display communication data SEG 3, 4: Off	-	-

To complete the installation, perform the following checks and tests to ensure that the air conditioner is operating correctly.

Review all the following elements in the installation :

- ◆ Piping connection tightness to detect any gas leakages
- ◆ Connecting wiring
- ◆ Heat-resistant insulation of the piping
- ◆ Drainage
- ◆ Earthing wire connection
- ◆ Correct operations (follow the steps below)

How to Test Operations

1 Check the power supply.

- ◆ Compressor power supply : L1(R)-Red, L2(S)-White, L3(T)-Black
Be careful about the cables so that they will not be mixed up.
- ◆ 220-240V power supply : L, N (Single phase cable)

2 Check the indoor unit(s).

- 2-1** Check that you have connected the power and communication cables correctly. (Communication cables should be connected with F1 and F2 terminals)
 - If the power cables and communication cables are mixed up or connected incorrectly, the PCB will be damaged.
- 2-2** Ensure the address of indoor units.
 - Choose appropriate address between 0 and F.
 - Each indoor unit must have different address.
- 2-3** Check the thermistor sensor, drain pump/hose, and electronic expansion valve are connected correctly.

3 Check the outdoor unit(s).

- 3-1** Check how many indoor units are installed and the number of indoor units registered on the rotary switch.
- 3-2** Check the DIP switch is at proper position.

4 Connect the outdoor unit to your computer where the provided software is installed, then power the outdoor unit on.

-
- 5** If the outdoor unit is powered on, it will start tracking to check user's option(s) and number of indoor unit. It takes about 20 seconds.
 - At this time, the SEG 1 and 2 on outdoor unit PCB display the number of indoor unit registered and the SEG 3 and 4 display the number of indoor units which responded.

-
- 6** If both sides numbers are equal, your computer will perform the next stage.

Note ♦ If 'E2' is displayed on the outdoor unit PCB at this time, you must check that you registered the number of indoor units and assigned addresses correctly. Then restart the tracking by pressing the key 3 in the outdoor unit.

-
- 7** Check the thermistor sensor, electronic expansion valve by using the computer.

-
- 8** Open the service valve, then press the test operation KEY on the outdoor unit PCB.

-
- 9** Check the pressure switch by a manifold gauge.
- Refer to the pressure table classified by outdoor temperature and length of piping.
 - The pressure is variable at the beginning of compressor operation. Thus, check the pressure valve after 20 minutes at least.
 - If there is an unusual noise and no change of pressure, you have to check the compressor power(L1, L2 and L3) and wire connection.

-
- 10** Check these elements by using the computer.

10-1 Check each indoor unit temperature, RPM, capacity code, and open degree of electronic expansion valve.

10-2 Check the temperature of compressor and condenser, and outdoor unit fan operation.

-
- 11** Check that there is any error mode in the outdoor unit PCB during the test.
- You should test operations for 2 hours or more.
 - Check that the water dripping from the drain hose runs away correctly and safely.

-
- 12** To finish the test, press the test operation KEY again.

-
- 13** After finishing the test, operate only one indoor unit in the cool mode for 30 minutes.
- Check the temperature of the other indoor units and leakage of electronic expansion valve. If there is no matter, turn the indoor unit off, then operate another indoor unit to check the previous indoor unit.
-

Troubleshooting

If an error occurs during the operation, it is displayed on the outdoor unit PCB.

Display		Explanation	Remark
SEG 1, 2	SEG 3, 4		
<i>Er</i> → <i>P0</i>	OFF	High temperature of Discharge (Protection control)	Error about protection control of outdoor unit
<i>Er</i> → <i>P2</i>	OFF	SUMP COMP DOWN	
<i>Er</i> → <i>P4</i>	OFF	Reverse phase error (Protection control)	
<i>Er</i> → <i>P5</i>	OFF	COMP DOWN due to frozen Eva of indoor unit	
<i>Er</i> → <i>P6</i>	OFF	Error of momentary power failure (disappears when the unit is Off/On)	
<i>Er</i> → <i>P7</i>	OFF	Compressor Down due to protection control of high pressure sensor	
<i>Er</i> → <i>P8</i>	OFF	Compressor Down due to protection control of low pressure sensor	
<i>Er</i> → <i>P9</i>	OFF	In removing frost	
<i>Er</i> → <i>PA</i>	OFF	Compressor Down due to protection control of condensation ratio	
<i>Er</i> → <i>t1</i>	OFF	Error of OUT TEMP sensor (OPEN/SHORT) Error level: Over 4.9V(-50°C), below 0.4V(93°C)	Errors about outdoor unit sensor (OPEN/SHORT)
<i>Er</i> → <i>t2</i>	OFF	Error of COND TEMP sensor (OPEN/SHORT) Error level: Over 4.9V(-50°C), below 0.4V(93°C)	
<i>Er</i> → <i>t3</i>	OFF	Error of PWM Discharge TEMP sensor (OPEN/SHORT) Detected when the outdoor temperature is over -10°C Error level: Over 4.95V(-30°C), below 0.5V(151°C)	
<i>Er</i> → <i>t4</i>	OFF	Error of liquid refrigerant pipe(cond out) TEMP (OPEN/SHORT) Error level: Over 4.9V(-50°C), below 0.4V(93°C)	
<i>Er</i> → <i>t5</i>	OFF	Error of OIL TEMP sensor (OPEN/SHORT) Detected when the outdoor temperature is over -10°C Error level: Over 4.95V(-30°C), below 0.5V(151°C)	
<i>Er</i> → <i>t6</i>	OFF	Error of SUCTION TEMP sensor (OPEN/SHORT) Error level: Over 4.9V(-50°C), below 0.4V(93°C)	
<i>Er</i> → <i>t7</i>	OFF	Error of high pressure sensor (OPEN/SHORT) Detected when the compressor is on SHORT error when below 0.4V, OPEN error when over 4.2V	
<i>Er</i> → <i>t8</i>	OFF	Error of low pressure sensor (OPEN/SHORT) Detected when the compressor is on SHORT error when below 0.4V, OPEN error when over 4.7V	
<i>Er</i> → <i>t9</i>	OFF	Error of fixed compressor discharge sensor (OPEN/SHORT)	
<i>Er</i> → <i>E1</i>	OFF	System Down caused by communication error after completion of tracking	Communication errors
<i>Er</i> → <i>E2</i>	OFF	Mismatching of the indoor unit numbers set with those communicated after completion of tracking	
<i>Er</i> → <i>E3</i>	OFF	Error of float switch in indoor unit	
<i>Er</i> → <i>E5</i>	OFF	Error of setting option switches for optional accessories	

Display		Explanation	Remark
SEG 1, 2	SEG 3, 4		
$E_r \leftrightarrow A x$	OFF	Breakaway of indoor unit eva sensor	Self-diagnostic detection (x : 0~F)
$E_r \leftrightarrow b x$	OFF	Breakaway of indoor unit eva out sensor	
$E_r \leftrightarrow C x$	OFF	Open error of electronic expansion valve	
$E_r \leftrightarrow d x$	OFF	Close error of electronic expansion valve	
$E_r \leftrightarrow F x$	OFF	Breakaway of eva mid and eva out sensors in indoor unit	
$E_r \leftrightarrow G2$	OFF	Total leakage of refrigerant in outdoor unit/Loading failure	
$E_r \leftrightarrow G3$	OFF	Breakaway of cond mid sensor in outdoor unit	
$E_r \leftrightarrow G4$	OFF	Open error of electronic expansion valve in outdoor unit (Detected once or more times)	
$E_r \leftrightarrow G6$	OFF	Breakaway of OIL temperature sensor (Detected once or more times)	
$E_r \leftrightarrow G8$	OFF	Breakaway of low pressure sensor	
$E_r \leftrightarrow G9$	OFF	Breakaway of high pressure sensor	
$E_r \leftrightarrow 9 x$	OFF	OPEN/SHORT error of room sensor in indoor unit	Displays related to indoor unit (x : 0~F)
$E_r \leftrightarrow r x$	OFF	OPEN/SHORT error of eva in sensor in indoor unit	
$E_r \leftrightarrow 4 x$	OFF	OPEN/SHORT error of eva out sensor in indoor unit	
$E_r \leftrightarrow u x$	OFF	Error of fan starting	
tU flickers	OFF	Below -5°C when cooling	Displays related to outdoor unit
tO flickers	OFF	Over 30°C when heating	
Ch flickers	OFF	Compressor starting delay control at the initial stage of power on (Under operation of CCH)	
Communication data	K1, K2, K3 flicker	Check mode: Displays Recovery of refrigerant/Adding refrigerant/ Test operation	
SEG 1: View mode(1~8) SEG 2~4: display data		View mode: Displays various temperature data	

The order of priority : E1→E2→E5→P0→P2→P5→P4→P7→P8→P9→P6→PA→G2→t1→t2→t3→t4→

t5→t6→t7→t8→G3→G4→G6→G8→G9→E3→Cx→Dx→Bx→Ax→Fx→Ch

- In case that the same error displays from multi-indoor units, the one having the faster address has the priority.

option

option

option

Chapter

2

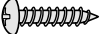
OPTIONAL ACCESSORIES

■ Parts List	33
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Parts List

Receiver & Display Unit Accessories

Concealed type

Receiver & display unit	STS 2S-2x10 tapped screw	2S-4x12 tapped screw	Wire kit (length 10m)	Owner's instructions	Installation manual
1	4	2	1	1	1
					

Standard type

Receiver & display unit	M4x16 tapped screw	Cable-tie	Cable clamp	Wire kit (length 10m)	Owner's instructions	Installation manual
1	7	2	5	1	1	1
						

Wireless Remote Controller Accessories

Wireless remote controller	Battery	Remote control holder	STS 2S-2x10 tapped screw	Owner's instructions	Installation manual
1	2	1	2	1	1
					

Parts List (cont.)

Wired Remote Controller Accessories

Wired remote controller	Cable-tie	Cable clamp	M4x16 tapped screw	Indoor unit power drawing cable	Owner's instructions	Installation manual
1	2	2	7	1	1	1
						

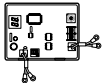
Centralized Controller Accessories

Centralized controller	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	5	7	1	1
					

Function Controller Accessories

Function controller	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	6	7	1	1
					

Transmitter Accessories

Transmitter	Transmitter power cable	Transmitter communication cable	Installation manual
1	1	1	1
			

Note ♦ If you would like to install the centralized controller, you must install the transmitter in the outdoor unit.

**THIS AIR CONDITIONER IS MANUFACTURED BY:
ESTE AIRE ACONDICIONADO HA SIDO FABRICADO POR:
CE CLIMATISEUR EST FABRIQUE PAR:
QUESTO CONDIZIONATORE D'ARIA È PRODOTTO DA:
ESTE APARELHO DE AR CONDICIONADO É FABRICADO POR:
DIESE KLIMAANLAGE IST FABRIZIERT VON:
ΑΥΤΗ Η ΣΥΣΚΕΥΗ ΚΑΤΑΣΚΕΥΑΣΤΗΚΕ ΑΠΟ:
ЭТОТ КОНДИЦИОНЕР ИЗГОТОВЛЕН ФИРМОЙ:**



ELECTRONICS